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I have recently made a new investigation of the data and have found that orbits with periods of 95 years and of 156 years will satisfy the observed position angles with equal accuracy. The shorter period, however, gives a rather better representation of the observed distances. It is also in favor of the shorter period that Struve failed to detect the pair. For 1831, the shorter period orbit gives a computed angular separation of only  $0''.8$ , while the larger orbit gives  $1''.75$ . Measures for another ten or twenty years are needed before a really satisfactory orbit can be computed. The two sets of elements which I have derived are as follows:

	ELEMENTS.	
	I	II
$P$	95.2 years	156.0 years
$T$	1905.0	1904.90
$e$	0.77	0.84
$a$	$0''.72$	$0''.955$
$i$	$\pm 22^\circ.95$	$0^\circ.0$
$\omega$	98.0	
$\Omega$	6.2	102.3 (position angle of periastron)

According to Kapteyn and Weersma, the absolute parallax of the system is  $+0''.021$ . Assuming the correctness of this value and of elements I, the mass is 4.45 times the Sun's mass, the semi-major axis of the orbit 34 astronomical units, and the absolute magnitudes of the two components 4.9 and 5.9 respectively.

R. G. AITKEN.

May, 1916.

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#### NOTE ON THE NEBULA N. G. C. 6610.

In comparing photographs of Selected Area No. 86 made for the determination of standard magnitudes it was noted that an object, apparently a planetary nebula, shown on a plate of an hour's exposure on August 27, 1911, does not appear on any of the other plates. The N. G. C. gives no record of any nebula in the position of the suspected planetary. The catalog declination of N. G. C. 6610 is, however, the same as that of the object, but the recorded right ascension is  $11^s$  greater. On the other hand, none of the photographs shows

any nebula in the catalog position of N. G. C. 6610 as bright as the 17th or 18th photographic magnitude. Either the N. G. C. position is in error or the nebula is variable. A mistake of  $10^s$  in right ascension would probably identify N. G. C. 6610 with the object on the Mount Wilson plate, but in this case we should certainly have a case of variability. The object photographed here shows the graded intensity and the granular or mottled structure which is characteristic of many small nebulae and fits the N. G. C. description of No. 6610 well enough, but it would be rash to say that it is not a photographic defect. Its position for 1875 is

$$18^h 11^m 26^s + 14^\circ 57'.2$$

In the meantime, it is clear enough that N. G. C. 6610 is subject to the uncertainty mentioned above.

FREDERICK H. SEARES.

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#### COLOR-PHOTOGRAPHS OF NEBULÆ.

Color-sensitive plates and special ray-filters have been used on one or two occasions to test the homogeneity of radiation from different parts of a nebula. Keeler, for example, compared ordinary photographs of the *Orion* nebula with others on isochromatic plates exposed behind a yellow screen, and was thus able to confirm Campbell's visual observations of variations in the relative intensity of the spectrum lines. In 1905, Hartmann, with filters of more restricted transmissibility, showed that the great photographic activity noted by Keeler in certain regions was to be attributed to the unusual intensity of the line  $\lambda 3727$ . Again a red-sensitive plate and a filter transmitting nothing to the violet of  $\lambda 5700$  enabled Mr. Hale to demonstrate the reality of the reddish fringe observed by Barnard, and later by Keeler, along the southern boundary of the Huyghenian Region, and to show that it was probably due to a local intensification of the  $H\alpha$  line of hydrogen.